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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Hiroshi Suganuma

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11/26/2004

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EXAMINER

CHANG, AUDREY Y

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 11/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/990,237	Applicant(s) SUGANUMA, HIROSHI	
	Examiner Audrey Y. Chang	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/17/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on September 16, 2004, which has been entered into the file.
- By this amendment, the applicant has amended claims 1, and 6-8.
- Claims 1-8 remain pending in this application.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph**, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 1, and 6-8 have been amended to include the phrases "a scan unit scanning the light ... to display a stereoscopic image" (claim 1), "a diffuser panel diffusing the ray ... to display stereoscopic image" (claim 6), "means for scanning the modulated light ... to display a stereoscopic image" (claim 7) and "displaying a stereoscopic image by scanning the modulated light" (claim 8). However the specification and the claims fail to teach how could a stereoscopic image be displayed in these manners. To begin with, it is not clear what kind of image is considered to be "*stereoscopic image*". It is known in the art that stereoscopic *vision* is an illusion of observer's eye caused by viewing two "stereoscopically related" *two dimensional* images. The image itself is *not* "*stereoscopic*" but if a pair of stereoscopically related images is transmitted to proper eye of the observer respectively, then *stereoscopic vision* can be created. It is therefore not sure how to construct or generate a **stereoscopic image that can be scanned**

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here. **Secondly**, the specification and the claims fail to teach where does the image, not to mention “stereoscopic image” come from. The grating light valve (GLV) as stated in the claims **only** gives *arbitrary phase distribution*. It is not clear if the image information is generated from the light valve or not. It is also not clear if the “arbitrary phase distribution” has anything to do with the “stereoscopic image” or not. The stereoscopic image display system recited in the claims therefore is **not operable**. **Thirdly**, a diffuser panel WILL NOT be able to display a stereoscopic image, as stated in amended claim 6.

Claims 2-5 inherit the rejections. **Clarifications are certainly required.**

Claim Objections

3. **Claims 1-8 are objected to because of the following informalities:**

(1). **Claims 1 and 6-8 have been amended** to include the feature of “displaying a stereoscopic image”. However there is no logical connection between the “arbitrary phase distribution” and the “stereoscopic image” the scopes of the claims therefore are confusing and indefinite since it not clear how are these related.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1-5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Bloom et al (PN. 5,982,553) in view of the patent issued to Kajiki (PN. 5,694,235) and Kowarz (PN. 6,307,663).**

Bloom et al teaches an *image display system* (30, Figure 4) wherein the system is comprised of a *light source having LEDs* (32R, 32G, 32B) for *generating laser beams having wavelengths in predetermined ranges of red, green and blue color*. The laser beams illuminate a *Grating Light Valve* (10), which is an *one-dimensional spatial light modulator*, for modulating the laser beams. The modulated laser beams are then *scanned* by a *scanning mirror* (58) to the location of an observer (64) for displaying **an image**, (please see Figure 4, and columns 7-9).

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the image display system is a stereoscopic image display system. **Kajiki** in the same field of endeavor teaches a three-dimensional image reproducing system that is comprised of *modulator* for modulating the light from light sources and *scanning system* for directing the modulated image light to produce stereoscopic image (15, Figure 9, **noted** the stereoscopic image is observed by having left eye perspective image and right eye perspective image being scanned to different image locations (16) and the eyes of the observer obtain an stereoscopic image illusion at (15)). It would then have been obvious to one skilled in the art to apply the teachings of **Kajiki** to modify the image display system of Bloom et al to make it capable of displaying *stereoscopic images* for the benefit of three-dimensional effect to the image displayed.

The Bloom et al reference teaches explicitly that the reflective grating light valve (GLV) array including a row of spaced-apart, elongated movable reflective-members aligned parallel to each other such that “each of the movable reflective-members is **individually** movable with respect to a corresponding fixed reflective-member” which implicitly will be able to give *arbitrary* (arbitrary read as any desired phase such as the phase distribution taught by the Bloom et al reference) phase distribution, (please see column 2, lines 33-40). However this reference does not teach explicitly that the reflective-members are *independently* driven. **Kowarz** in the same field of endeavor teaches a spatial light modulator with conformal grating device wherein a plurality of elongated reflective ribbon elements (23a

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to 23d Figures 1 and 2) are *mechanically* and *electrically isolated from one another* to allow *independent* operation of grating devices defined by the elongated reflective members respectively and implicitly will give arbitrary phase distributions, (please see column 4, lines 11-18). It would then have been obvious to one skilled in the art to apply the teachings of Kowarz to modify the spatial modulator of Bloom et al for the benefit of allowing independent control and operation of each of the reflective-members for the benefit of allowing better control of the spatial modulator therefore better image quality.

With regard to claim 2, **Bloom et al** teaches that the direction of scanned light is in 45 degrees with respect to the array direction of the Grating Light Valve. Although these references do not teach explicitly that the scanning direction is perpendicular to the array direction such variation is considered to be an obvious matters of design choice to one skilled in the art for the benefit of making the display system to have different arrangement that may be suited for different viewing purpose.

With regard to claims 4 and 6, Bloom et al does not teach explicitly to include a diffusion panel. **Kajiki** teaches to use a *diffusion plate*, (which known in the art having the ability of making the light have more uniformly distributed intensity), for reproducing and displaying the stereoscopic image to the observer. It would then have been obvious to one skilled in the art to apply the teachings of Kajiki to modify the image display system of Bloom et al for the benefit of providing more uniformly distributed image to the observer.

With regard to claim 6, **Bloom et al** teaches to use a lens (50, Figure 4) to *collimate* the modulated light from the Grating Light Valve. **Bloom et al** also teaches that an image forming lens such as (53 or 55) may be used to focus the image light, (please see Figures 6 and 7). It is known in the art that an image focusing lens has the inherent property of performing Fourier transformation.

6. **Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Bloom et al (PN. 5,982,553) in view of the patent issued to Kajiki (PN. 5,694,235).**

Claims 7 and 8 have been amended and the reasons rejection responding to the amended claims are given as follows.

Bloom et al teaches an *image display system* (30, Figure 4) wherein the system is comprised of a *light source having LEDs* (32R, 32G, 32B) for *generating laser beams having wavelengths in predetermined ranges of red, green and blue color*. The laser beams illuminate a *Grating Light Valve* (10), which is an *one-dimensional spatial light modulator*, for modulating the laser beams. The modulated laser beams are then *scanned* by a *scanning mirror* (58) to the location of an observer (64) for displaying an image, (please see Figure 4, and columns 7-9). Bloom et al teaches explicitly that the reflective grating light valve (GLV) array including a row of spaced-apart, elongated movable reflective-members aligned parallel to each other such that “each of the movable reflective-members is **individually** movable with respect to a corresponding fixed reflective-member” which implicitly will be able to give *arbitrary* (arbitrary read as any desired phase such as the phase distribution taught by the Bloom et al reference) phase distribution, (please see column 2, lines 33-40).

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the image display system is a stereoscopic image display system. **Kajiki** in the same field of endeavor teaches a three-dimensional image reproducing system that is comprised of modulator for modulating the light from light sources and scanning system for directing the modulated image light to produce stereoscopic image (15, Figure 9, noted the stereoscopic image is observed by having left eye perspective image and right eye perspective image being scanned to different image locations (16) and the eyes of the observer to obtain an stereoscopic image illusion at (15))). It would then have been obvious to one skilled in the art to apply the teachings of Kajiki to modify the image display system of Bloom et al to make it capable of displaying stereoscopic images for the benefit of three-dimensional effect to the image displayed.

Response to Arguments

7. Applicant's arguments filed on September 16, 2004 have been fully considered but they are not persuasive.

8. In response to applicant's arguments, which state the cited Bloom et al reference does not teach explicitly that the one-dimensional spatial modulator including one-dimensional arrayed elements that are driven to generate an *arbitrary* phase distribution, which therefore differs from the instant application, the examiner respectfully disagrees for the reasons stated below. The Bloom reference, ((PN. 5,982,553) teaches explicitly that the reflective grating light valve (GLV) array including a row of spaced-apart, elongated movable reflective-members aligned parallel to each other such that "each of the movable reflective-members is individually movable with respect to a corresponding fixed reflective-member which therefore will be able to give *arbitrary* phase distribution, (please see column 2, lines 33-40). Furthermore, in response to applicant's argument which states that the term "arbitrary" as defined in the dictionary means "*randomly chosen*" and "*based on chance rather than being planned or based on reason*" (please see the Remark) which therefore distinguishes from the *phase distribution* imparted by the grating light valve of Bloom et al, the examiner respectfully disagrees for the reasons stated below. Bloom et al teaches the GLV array (10) is addressed and controlled by the control circuit (70) based on *image video data* for displaying, (please see column 8, lines 32-35). The GLV array therefore generate *phase distribution* according to the movement of the individual elongated movable reflective-members of the GLV array. In the same manner the instant application also teaches that the GLV is driven by the *display image data* (please see Figure 8). This means firstly the phase distribution generated by the GLV of instant application cannot be arbitrary according the dictionary definitions given by the applicant since the GLV is controlled and driven by the *image data* which therefore is not "randomly chosen" or is not "*based on chance rather than being planned or based on reason*". The GLV in the contrary is driven according to reasons and plan, i.e. the display image data. Secondly, if the phase distribution generated

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by the GLV of the instant application is considered “*arbitrary*” then the phase distribution of the GLV in the Bloom et al system has also to be identified as “*arbitrary*” the **same way** as the instant application since in **both** the Bloom et al reference and the instant application the GLV is driven by the display image data.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

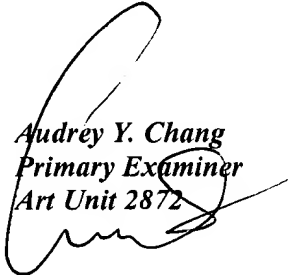
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Audrey Y. Chang
Primary Examiner
Art Unit 2872

A. Chang, Ph.D.